

REMARKS

The Office Action issued 17 April 2003 has been reviewed and the comments of the U.S. Patent and Trademark Office have been considered. Claims 1 and 10 have been amended. Claims 3-5 have been canceled without prejudice or disclaimer. Claims 6-9 and 20 were canceled without prejudice or disclaimer in the respective amendments filed August 09, 2001 and May 06, 2002. Claims 10-19 have been allowed. Claims 21-23, pursuant to a restriction requirement issued 20 December 2002, have been canceled without prejudice or disclaimer. Applicants reserve the right to pursue these claims in a divisional application. Accordingly, Applicants request reconsideration of the pending claims 1, 2, and 10-19.

Applicants thank the Examiner for indicating that claims 10-19 have been allowed.

The drawings stand objected to for illustrating a slot extending radially on a swirl disk and for allegedly failing to show a generally constant cross section of a swirl generator. Applicants have amended claims 1 and 10 based on the Examiner's comments to overcome the objections. In particular, claim 1 has been amended to recite that a swirl generator has a guide disk contiguous to a flat disk, and each of the guide disk and the flat disk has a first surface generally parallel to a second surface extending from an outer perimeter to a central aperture of respective disks. Further, claim 10 has been amended to recite that a slot extends radially from a fuel passage opening to a central aperture so that a portion of the slot is tangential to the central aperture. Accordingly, the objections to the drawings have been overcome and should be withdrawn.

Claims 1 and 2 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to provide adequate written description and support for the feature of a constant cross-section of a swirl generator, and therefore fails to reasonably convey to one skilled in the art that Applicants had possession of the claimed invention.

Applicants respectfully assert that, at least at the time of filing of this application, the inventors had possession of the claimed invention. As stated in MPEP § 2163, "[a]n applicant shows possession of the claimed invention by describing the claimed invention ... using such descriptive means as words, structures, figures, diagrams and formulas that fully set forth the claimed invention." In particular, Applicants have shown possession of the claimed invention as a whole as recited in claims 1 and 2 by a side view of Fig. 2A, of a cross-section extending

through the longitudinal axis and plan views of the guide disk and swirl disk, as shown in Figs 3 and 4 of Ren (which were incorporated by reference and relabeled as Figs. 4A and 4B). Thus, one skilled in the art would appreciate that the originally filed specification including the claims and drawings provides for the features of the claimed invention as a whole so as to clearly support that the originally filed application, and unequivocally conveys that the inventors had possession of the claimed invention.

In an effort to advance prosecution of the application, however, applicants have amended claim 1 to recite that each of the guide disk and flat disk has a first surface generally parallel to a second surface extending from an outer perimeter to a central aperture of respective disks so that the first and second surfaces define a generally constant cross-section therebetween. Accordingly, the rejection for allegedly failing to provide a written description of the claimed invention should be withdrawn.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Daly. Insofar as the rejection is applicable to amended claim 1, Applicants respectfully traverse because Daly fails to teach or suggest the claimed invention as a whole.

Amended claim 1 recites a direct injection fuel injector that includes, *inter alia*, a seat disposed at the outlet portion of the body and a swirl generator. The seat has a passageway providing a fuel distribution outlet through the passageway. The seat includes a circumferential portion disposed within the body and directly connected to the interior surface of the body. The swirl generator is disposed proximate the seat. The swirl generator has a guide disk contiguous to a flat disk. Each of the guide disk and the flat disk has a first surface generally parallel to a second surface extending from an outer perimeter to a central aperture of respective disks. Support for this amendment to claim 1 is provided by the originally filed specification at, for example, page 6 and in Figures 1-4.

Daly fails to teach or suggests a seat with a circumferential portion disposed within a nozzle directly connected to the interior surface of the nozzle. In particular, Daly states that a seat 26 has a circular hole 28 for fuel to flow through. *See*, Daly at column 2, lines 24-33. The seat 26 is shown as being disposed within nozzle 12 in Figures 1 and 2 of Daly. The seat 26 has a circumferential portion spaced from the inner surface of nozzle 12 with a polymeric member (e.g., an O-ring). The polymeric member apparently provides for a seal between the inner

surface of the nozzle 12 and the circumferential portion of seat 26. Thus, Daly fails to teach or suggest a circumferential portion of a seat disposed within a body, and directly connected to the interior surface of the body so that the circumferential portion is contiguous to an interior surface of the inner portion, as recited in claim 1. Accordingly, claim 1 is patentable for at least this reason because Daly fails to teach or suggest this feature of the claimed invention as a whole.

Daly also fails to teach or suggests a swirl generator that has a guide disk and a flat disk, i.e., two separate members, and each of the two separate members has a first surface generally parallel to a second surface extending from an outer perimeter to a central aperture. In particular, Daly states that the member 18 is configured to minimize a trapped volume of fuel by having an increase in the cross-sectional area of the member 18 between the outer perimeter of the member and the central opening 25. *See*, Daly at column 3, lines 5-18. That is, Daly employs a single-piece member 18 to minimize trapped fuel between the single member 18 and the seat 26. Because Daly specifies a single member 18, Daly fails to teach or suggest a guide disk and a flat disk, as recited in claim 1. Accordingly, claim 1 is patentable for at least this reason.

Moreover, the member 18 of Daly has a first surface facing an inlet 14 and a second surface facing a frustoconical surface of seat 26; the second surface has a surface between an outer perimeter and a central aperture oblique to the first surface. Because Daly employs a surface oblique to the first surface of member 18, Daly fails to teach or suggest first and second generally parallel surfaces extending from the outer perimeter to a central aperture of each of a guide disk and flat disk. Accordingly, claim 1 is patentable for at least this reason because Daly fails to teach or suggest features of the claimed invention as a whole.

Furthermore, claim 1 recites that the body passage maintains an operative relationship between a body and a needle when the body is exposed to operating temperatures of a cylinder of an engine. To the extent that the Examiner considers the functional “[w]hen the body is exposed to operating temperatures of a cylinder of an engine” as capable of being performed by Daly, the Examiner is respectfully reminded that the functional recitation of claim 1 must be evaluated and considered, “[j]ust like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used.” *See*, MPEP 2173.05(g), page 2100-206 (8th Ed., Rev. 1, Feb. 2003). That is, when this functional recitation is evaluated and considered in relation to Daly, the conclusion that Daly is capable of performing the same

function by the Office Action must be supported by some explanation or objective evidence for such conclusion. Daly states that the injector sprays fuel towards an intake valve of an engine (col. 1, lines 43-46), it would also be apparent to one of ordinary skill in the art that the body of Daly is not exposed to operating temperatures of an engine. And because Daly provides for a resin or plastic bodied fuel injector, in a preferred embodiment, and does not provide for a metallic cylindrical annulus with an inner diameter that maintains an operative relationship when exposed to operating temperatures of a cylinder of an engine in a direct injection environment, it would be apparent to one of ordinary skill in the art that Daly is not capable of achieving the claimed function. Accordingly, claim 1 is patentable over Daly for at least this reason.

Claims 3-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wieczorek in view of Muller. Applicants respectfully note that claims 3-5 have been canceled, thereby rendering this rejection moot.

Although claims 3-5 have been canceled, to the extent that citation of U.S. Patent No. 5,947,382 (Kelly) is relied upon by the Examiner to support the proposition that one of ordinary skill would readily apply teachings of a direct injection fuel injector to a non-direct injection fuel injector, applicants submit that the reliance on Kelly by the Examiner is erroneous because Kelly fails to support this proposition.

The Examiner apparently interprets the term “indirect” in the phrase “indirect servo-controller common rail fuel injector” in Kelly to impute that Kelly refers to a “non-direct injection fuel injector,” which is erroneous. Consequently, the term “indirect servo-controller common rail fuel injector” of Kelly apparently denotes a type of a servo-controller for a common rail fuel injector.

The common rail fuel injector of Kelly has an indirect servo-controller, and the common rail injector is affixed to a cylinder so that one end of the common rail injector directly injects fuel into the cylinder. *See*, Kelly at column 1, lines 14-29. Applicants respectfully note that Kelly uses the word “indirect” to modify the term “servo-controller” whereas, as used by the applicants, the word “non-direct” modifies the term “injection.” Thus, the statement of Kelly regarding “indirect servo controller common rail fuel injector” fails to support the above proposition that one of ordinary skill in the art would readily apply teachings from a direct injection fuel injector to a non-direct or indirect injection fuel injector, and vice versa.

Claim 2 depends ultimately from independent claim 1, is therefore also allowable for at least the same reason as claim 1, as well for reciting additional features.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request consideration of the application and prompt allowance of the pending claims. Applicant respectfully invites the Examiner to contact the undersigned at (202) 739-5203 if there are any outstanding issues that can be resolved via a telephone conference.


EXCEPT for issue fees payable under 37 C.F.R. §1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. §§1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0310. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. §1.136(a)(3).

Respectfully submitted,

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